

The greatest service which can be rendered any country
is to add [a] useful plant to its culture . . .

Thomas Jefferson
American President/Author (1743–1826)

Forum

Latex Allergies Stretch Beyond Rubber Gloves

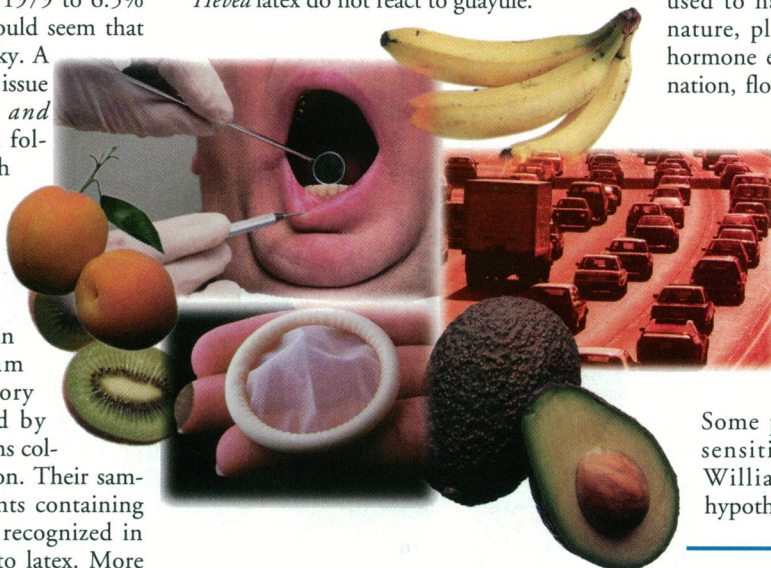
With the number of latex allergies jumping from a single case report in 1979 to 6.5% of Americans in 1994, it would seem that latex is dropping from the sky. A report in the January 1995 issue of the *Journal of Allergy and Clinical Immunology* and a followup article in the March 1996 issue of *Chest* find that urban air does contain latex particles, shed into the environment by normal tire wear.

Along a four-lane road in Denver, Colorado, a team from the Allergy Respiratory Institute of Colorado led by immunologist Brock Williams collected particulate air pollution. Their samples included black fragments containing latex proteins, which were recognized in tests by human antibodies to latex. More than half (58%) of the airborne debris was small enough to be inhaled into the lungs. Airborne latex could partially explain the rise in latex sensitization. "Until we know more about it," says Williams, "it's difficult to weigh the importance of airborne latex to the overall problem. But it's probably in every city in the world with cars."

Proteins in the sap of the Brazilian rubber tree (*Hevea brasiliensis*)—used to produce latex—trigger latex allergies ranging from annoying skin rashes to anaphylactic shock. The surge in latex allergies coincided with increased global demand for latex gloves in the late 1980s to prevent the spread of HIV and hepatitis. Manufacturing shortcuts, such as skipping washing steps that remove latex proteins, contributed to the epidemic that first struck medical personnel exposed to latex-containing supplies. Recent studies find that latex allergies affect up to 14% of healthcare workers.

Because 57 latex proteins are known allergens, removing them is impractical. So is avoiding rubber, which is found in 40,000 items, including 300 medical products. To circumvent latex allergies, USDA researchers at the Western Regional Research Center in Albany, California, have developed hypoallergenic rubber from

guayule (*Parthenium argentatum*), a shrub native to the southwestern United States. In clinical trials to be published in the *Journal of Allergy and Immunology*, people allergic to *Hevea* latex do not react to guayule.



Latex in our lives. A combination of exposures to proteins found in latex products and certain foods may be the cause of a rise in latex allergies.

The USDA team, headed by plant physiologist Katrina Cornish, created processing methods to extract guayule and manufacture rubber products with superior resilience, strength, and elasticity. The USDA granted an exclusive license for the patented technology to American Medical Products in Burlingame, California. The first guayule products will be medical supplies for latex-sensitive patients and medical workers. Cornish is continuing genetic studies to improve latex yields and adapt guayule for growth in diverse climates.

Up to half of latex-sensitive patients also show allergic reactions to certain fruits including avocados, bananas, kiwifruits, papayas, and peaches, according to a study published in the October 1994 issue of the *Annals of Allergy*. "These plants contain the same proteins that are allergens in latex," says Dennis Ownby, director of pediatric allergy research at Henry Ford Hospital in Detroit, Michigan. People with fruit allergies should warn physicians before undergoing procedures, he says, because anaphylactic reactions from contact with physicians' latex gloves have occurred in those with mild fruit allergies.

Williams, now director of research at IBT Reference Laboratory in Lenexa, Kansas, theorizes that this fruit/latex cross-reactivity is worsened by ethylene, a gas used to hasten commercial ripening. In nature, plants produce low levels of the hormone ethylene, which regulates germination, flowering, and ripening. But when

forced to ripen quickly under high ethylene concentrations, plants produce allergenic wound-repair proteins, which are similar to wound-repair proteins made during the tapping of rubber trees. Sensitive individuals who ingest the fruit "get a higher dose and worse reaction," suggests Williams.

Some people may even first become sensitized to latex through fruit, Williams suggests, although this hypothesis remains to be proven.

Women's Health Initiative

Attempting to make up for the historic exclusion of women from clinical research, Bernadine Healy, then head of the National Institutes of Health, launched the Women's Health Initiative (WHI) in 1991. The WHI is an ambitious effort to evaluate several strategies aimed at preventing heart disease, breast and colorectal cancer, and osteoporosis in postmenopausal women.

The initiative is divided into three parts. The first part encompasses three clinical trials evaluating the benefits of a low-fat diet, hormone replacement therapy, and calcium and vitamin D supplementation, respectively.

The second part of the initiative, an observational study, runs simultaneously with the clinical trials. Participants are followed for 8 to 12 years while investigators track a wide range of factors to determine the relationship of these variables to disease outcome. Participants regularly fill out questionnaires on items such as diet, environmental exposures, exercise, and smoking. In addition, clinics store participants' blood samples for later evaluation. Both the clinical and observational studies began recruiting volunteers in 1993.